

### **REMARKS**

Claims 1-20 are pending, with claims 1, 7, 14, 15, and 16 being independent. Claims 1, 2, and 4-20 are amended. Support for these amendments may be found, for example, at page 6, lines 17-21; page 9, line 21 to page 10, line 1; and page 11, lines 15 to 25. No new matter has been added.

Claims 1, 2, 5-8, 11, 12, 14-17, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. patent application No. 2004/0151268 to Hidaka et al. (Hidaka) in view of U.S. patent No. 6,144,697 to Gelfand et al. (Gelfand). Claims 3, 9, and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hidaka in view of Gelfand, and further in view of U.S. patent No. 5,179,302 to Wagner et al. (Wagner). Claims 4, 10, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hidaka in view of Gelfand and Wagner, and further in view of U.S. patent No. 6,968,167 to Wu et al. (Wu). Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hidaka in view of Gelfand, and further in view of U.S. patent application No. 2005/0019042 to Kaneda et al. (Kaneda).

In response to the rejection of claims 1, 2, 5-8, 11, 12, 14-17, 19, and 20, Applicant respectfully submits that the proposed combination of Hidaka and Gelfand fails to establish a prima facie case of obviousness, because one of ordinary skill in the art would not have been motivated to combine Hidaka and Gelfand to obtain the subject matter of at least the independent claims 1, 7, 14, 15, and 16. Further, even if Hidaka and Gelfand were combined in the proposed manner, the resulting combination would fail to include all of the elements of at least the independent claims 1, 7, 14, 15, and 16.

For example, independent claim 1 recites:

An optical communication device comprising:

a continuous time filter having an adjustable bandwidth, wherein the continuous time filter is configured to reduce channel induced pre-cursor interference in an incoming data signal and generate a filtered incoming data signal;

a decision feedback equalizer, coupled to the continuous time filter, and configured to reduce post-cursor interference in the filtered incoming data signal and output a compensated signal and equalized data; and

a bandwidth controller configured to receive the compensated signal from the decision feedback equalizer and estimate a bandwidth error of the continuous time filter based thereon, the bandwidth controller further configured to generate a control signal based on the bandwidth error and to adjust the bandwidth of the continuous time filter using the control signal, and thereby reduce the bandwidth error as determined from the decision feedback equalizer.

In the present rejection, the Office Action takes the position that Hidaka discloses “a continuous time filter” and “a bandwidth controller,” and references the continuous time analog filter 32 and the adaptation control 39, respectively, of that reference. The Office Action admits that Hidaka fails to disclose a decision feedback equalizer, and relies on Gelfand for this teaching. However, even assuming for the sake of this response that an artisan of ordinary skill at the time of the invention would have combined the continuous time analog filter 32 and the adaptation control 39 of Hidaka with the decision feedback equalizer of Gelfand, Applicant respectfully submits that the resulting combination would not have included the claimed “bandwidth controller” as being “...configured to receive the compensated signal from the decision feedback equalizer and estimate a bandwidth error of the continuous time filter based thereon, the bandwidth controller further configured to generate a control signal based on the bandwidth error and to adjust the bandwidth of the continuous time filter using the control signal, and thereby reduce the bandwidth error as determined from the decision feedback equalizer,” as recited in independent claim 1 (with emphasis added). Therefore, the proposed combination fails to disclose every element of at least independent claim 1, and, moreover, none of Hidaka, Gelfand or any of the prior art of record would have provided proper motivation to make the proposed combination at the time of the invention.

Accordingly, Applicant respectfully submits that independent claim 1 is allowable for at least the above reasons, so that claims 2-6, which depend from claim 1, are allowable for at least the same reasons.

Similarly, independent claim 7 recites:

A receiver comprising:

a continuous time filter having an adjustable bandwidth, wherein the continuous time filter is configured to reduce channel induced distortion in a information signal received from a communications channel as a function of the adjustable bandwidth, and is further configured to generate a filtered information signal;

a decision feedback equalizer configured to receive the filtered information signal and to reduce inter-symbol interference in the filtered information signal to produce equalized data, and further configured to output a compensated signal; and

a bandwidth controller configured to receive the compensated signal and to adjust the adjustable bandwidth based thereon, and thereby to tune a frequency response of the continuous time filter to approximate an inverse of at least a portion of the frequency response of the communication channel.

As may be appreciated from the above discussion, none of Hidaka, Gelfand, or any of the prior art of record disclose or properly suggest at least, “a bandwidth controller configured to receive the compensated signal and to adjust the adjustable bandwidth based thereon, and thereby to tune a frequency response of the continuous time filter to approximate an inverse of at least a portion of the frequency response of the communication channel,” as recited in independent claim 7. Consequently, Applicant respectfully submits that independent claim 7 is allowable, along with claims 8-13 (by virtue of their dependency thereon).

Independent claim 14 recites:

receiver means coupled to communication media for receiving the transmitted information signal, the receiver means comprising

filter means for filtering the received information signal,

bandwidth control means for adjusting the bandwidth of the filter means to reduce channel induced distortion in the received information signal, and

equalizer means coupled to the filter means for reducing inter-symbol interference in the filtered information signal

The sixth paragraph of Section 112 states: “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of

structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” In the present case, independent claim 14 recites “receiver means” comprising “filter means,” “bandwidth control means,” and “equalizer means,” which should therefore be construed to cover corresponding structure described in the present specification, and equivalents thereof. As a result, for example, Applicant respectfully submits that at least the “bandwidth control means” corresponds to such structure within the present specification as described above with respect to claims 1 and/or 7, so that claim 14 is allowable for at least the reasons cited above.

Independent claim 15 recites:

A method for receiving an information signal, comprising:

- filtering a current symbol of an information signal using a first filter bandwidth to obtain a filtered information signal;
- equalizing the filtered information signal using a previous symbol of the information signal;
- generating a bandwidth error signal from at least the equalized filtered information signal;
- adjusting the first filter bandwidth to a second filter bandwidth; and
- filtering a next symbol of the information signal with the second filter bandwidth to reduce the bandwidth error signal.

None of Hidaka, Gelfand, nor any proper combination of the two, discloses or suggests at least “generating a bandwidth error signal from at least the equalized filtered information signal,” as recited in independent claim 15. Therefore, Applicant submits that independent claim 15 is allowable for at least these reasons.

Independent claim 16 recites:

An optical communication device comprising:

- a continuous time filter having at least one cascaded low pass filter, each of the at least one cascaded low pass filter having an adjustable bandwidth, wherein the continuous time filter is configured to reduce channel induced pre-cursor interference in an incoming data signal and generate a filtered incoming data signal;

- a decision feedback equalizer, coupled to the continuous time filter, and configured to reduce post-cursor interference in the filtered incoming data signal and output a compensated signal; and

- a bandwidth controller configured to receive the compensated signal from the decision feedback equalizer and estimate a bandwidth error of the continuous time filter based thereon, the bandwidth controller further configured to generate a control signal based on the bandwidth error and to adjust the bandwidth of the at least one cascaded low pass filter using the control signal, and thereby reduce the bandwidth error as determined from the decision feedback equalizer.

As may be appreciated from the discussion above with respect to claim 1, the proposed combination of Hidaka, Gelfand, and Wagner in the rejection of claim 16 fails to disclose every element of that claim, and, moreover, none of Hidaka, Gelfand, or Wagner, or any of the prior art of record, would have provided proper motivation to make the proposed combination at the time of the invention. In particular, for example, Wagner is included merely for its alleged teaching of a cascaded low-pass filter(s). Again, without agreeing to the validity of this allegation, Applicant submits that Wagner does not cure the deficiencies of Hidaka and Gelfand as described above, e.g., the failure of those references (or any proper combination thereof) to disclose or properly suggest, “the claimed “bandwidth controller” as being “...configured to receive the compensated signal from the decision feedback equalizer and estimate a bandwidth error of the continuous time filter **based thereon**,” as recited in independent claim 16.

Accordingly, Applicant respectfully submits that independent claim 16 is allowable for at least the above reasons, so that claims 17-20, which depend from claim 16, are allowable for at least the same reasons.

Conclusion


Applicant believes that all pending claims are in condition for allowance and respectfully requests notification to that effect. The Examiner may telephone Applicant's attorney (202-470-6452) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-3521.

Respectfully submitted,

Brake Hughes Bellermann LLP  
Customer No. 57246  
Phone 202-470-6452

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By: 

William G. Hughes  
Reg. No. 46,112

WGH/cjj